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SEABASING AND SHIP-TO-OBJECTIVE MANEUVER: AN ANALYSIS OF THESE CONCEPTS AND THEIR IMPLICATIONS FOR THE JOINT FORCE COMMANDER

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ABSTRACT

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Expeditionary Maneuver Warfare is the United States Marine Corps' capstone concept for the twenty-first Century. It encompasses the way Marines train, equip, organize, lead, think, and fight. It is an integral component of the Navy's Sea Power 21 concept, specifically its Sea Strike concept. Within this overarching concept are the complimentary concepts of Operational Maneuver from the Sea (OMFTS), Sea Based Logistics (Seabasing), and Ship-to-Objective Maneuver (STOM). This paper focuses on STOM and its enabling capability, Sea Based Logistics.

Seabasing is a potentially transformational capability dependent upon future classes of maritime propositioning and amphibious ships that will allow for the creation of a sea base from which operations ashore can be sustained without the need for ground logistics bases. This capability frees future naval joint forces from the requirement of host-nation air and seaports of debarkation. It also reduces the logistics footprint ashore for ground forces and allows for rapid movement to multiple objectives via surface and vertical lift assets without pausing at the shoreline in order to establish a beachhead and build logistical sustainment. Forces ashore are sustained from the sea base which, in turn, is sustained from extended air and sea lines of communications reaching back to intermediate support bases connected to the United States. This system is capable of increasing throughput through the sea base if initial operations grow into sustained operations ashore requiring more forces, equipment and sustainment.

Ship-to-Objective Maneuver is the tactical and operational extension of EMW. It allows surface and vertical assault units to move from the sea base to their assigned objectives in tactical formation. This capability is made possible by future technologies like the MV-22 Osprey, Expeditionary Fighting Vehicles (newest version of the amphibious assault vehicle), the improved Landing Craft Air Cushion, and the future version of the heavy-lift helicopter CH-53E. Vertical assault forces will be capable of missions ranging out to 110 nautical miles from the sea base and possibly further as this concept and its accompanying technologies mature. Surface

forces can travel from a sea base located 25 miles over the horizon and continue inland to either link up with vertical assault forces or attack separate objectives.

The paper analyzes the viability of this concept. Specifically, it reviews current studies conducted to determine the operational reach capabilities of Marine Expeditionary Brigades and Marine Expeditionary Units. It discusses issues requiring resolution or further study before the concept becomes operational reality. And, lastly, it discusses the implications this concept and these technologies have for the joint force commander and national command authorities.

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OVERVIEW

The developing concept of *Ship-to-Objective Maneuver* (STOM) within the United States Marine Corps relates to parent concepts - *Expeditionary Maneuver Warfare* (EMW), *Operational Maneuver From the Sea* (OMFTS), and *Sea Based Logistics* (Seabasing). Specifically, recent studies focus on determining the operational reach capabilities of Marine Expeditionary Unit, Special Operations Capable (MEU/SOC) and Marine Expeditionary Brigade (MEB)-sized forces in the 2015 timeframe. This is the projected date for fielding multiple systems, vessels/vehicles, and equipment that are necessary for full implementation of these concepts. The objectives are to analyze the operational reach of STOM as determined by recent studies, determine what the Marine Corps wants to do with this capability, determine what the naval Services need to do in order for STOM to become an operational reality, and determine what this capability offers national command authorities and joint force commanders.

The United States Navy and the United States Marine Corps published a White Paper in the early 1990s entitled *Forward… From the Sea.* It signaled a significant shift for the American Navy from a traditional blue water operations focus to meeting the growing threats from the littorals. It also signaled a closer doctrinal relationship with the Marine Corps whose mission has always been focused on the littorals. The foundation and hallmark of the United States Marine Corps has been its expeditionary combined-arms capabilities coupled with its institutionalized expeditionary mindset, culture, and structure. Its relationship with, and dependence on, the Navy makes *Forward…From the Sea* even more significant in its focus on closer cooperation between the two Services in order to maximize current capabilities and to develop new ones to meet current and future threats.

In 1997, the Marine Corps developed the concept of *Operational Maneuver from the Sea (OMFTS)*. This applied the tenets of maneuver warfare to sea space. OMFTS views the sea as maneuver space, not an obstacle. Naval amphibious forces use the sea for positional advantage, not allowing the enemy to dictate the location of attack. The concept aims to create a dilemma that forces the enemy to defend the length of his coast or littoral area by giving American naval forces the option to strike at the time and place of its choosing.[1] The principles of OMFTS are:

- A focus on operational objectives.
- The use of the sea as maneuver space.
- The generation of overwhelming tempo and momentum.
- The pitting of strengths against weaknesses.
- The emphasis of intelligence, deception, and flexibility.
- The integration of all organic, joint, and combined assets.[2]

The Marine Corps developed the concept of *Expeditionary Maneuver Warfare* (EMW) subsequent to OMFTS. It is the Corps' overarching warfighting doctrine that encompasses the tenets of OMFTS and both refines and expands them. The Marine Corps considers EMW its capstone concept that supports its direction for the twenty-first century as outlined in *Marine Corps Strategy 21*. The Marine Corps sees EMW as the union of its core competencies, maneuver warfare philosophy, expeditionary heritage, and the concepts by which it will organize, deploy, and employ forces.[3] Imbedded within EMW and OMFTS are the concepts of Seabasing, STOM, and Sustained Operations Ashore.

Seabasing is the enabling concept of EMW/OMFTS and, specifically, STOM. It is being jointly developed with the Navy. It is integral to *Sea Power 21*, the Navy's vision for the twenty-first century.[4] Its premise is the creation of vessels, systems, and capabilities that allow for prolonged sustainment of forces ashore from a floating logistics base at sea. This eliminates the need for an operational pause while logistic support is delivered to shore. This logistics sea base is located over-the-horizon (OTH). It is not a single ship or capability. Rather, it is a system of systems built upon capabilities in Maritime Prepositioning Forces, Future (MPF(F)), Navy amphibious ships, and myriad other capabilities. The tenets of sea based logistics are:

- Primacy of the sea base: over the horizon positioning, reduced or eliminated footprint ashore.
- Reduced demand: sea based support, technology improvements, lighter forces ashore.
- In-stride sustainment: network-based, automated logistics for maneuver units.
- Adaptive response and joint operations: expanded missions, joint support.
- Force closure and reconstitution at sea: building and restoring combat power.[5]

The most significant capabilities that seabasing enables are assured access and rapid force projection. Seabasing is not dependent on host nation support or benign deep-water ports. As the chief enabler of EMW and STOM, it also potentially defeats antiaccess defenses by

allowing maneuver forces to avoid them. If such defenses prove unavoidable, then seabasing supports forcible-entry antiaccess operations and joint follow-on forces.[6]

Maritime Prepositioning Force, Future (MPF(F)) is to seabasing what seabasing is to EMW and STOM. It is the fundamental capability that makes it work. Of all the capabilities being developed to support Marine Strategy 21, Sea Power 21, and the Naval Operating Concept for Joint Operations, it is the closest to being truly transformational. These ships will have the capability for at-sea arrival and assembly of units, direct support of the assault echelon of the amphibious task force (ATF), now known as the Expeditionary Strike Group (ESG), long-term sea-based sustainment of the landing force, and, at-sea reconstitution and redeployment of the force. Several new technologies are being explored during its development: selective on-load and off-load, internal ships systems (i.e., automated warehousing, item/pallet/container operations, roll-on/roll-off systems, and flow patterns), external ship systems (i.e., ramps, lighterage, and other craft interfaces), modular system/sub-system concepts, and aircraft interface technology. [7]

The ability for a MEB-sized force to be operational from the sea base within seven to ten days from initial deployment can significantly alter the initial conditions of a conflict.[8] This is the operational objective of STOM as enabled by seabasing.

Ship-to-Objective Maneuver is the tactical extension of OMFTS. It projects forces ashore in fighting formation without seizing a beach lodgment. It treats the sea as maneuver space, using it as a protective barrier and a high-speed avenue of approach. It places forces ashore and inland at multiple points, creating a dilemma for the enemy and expanding the tactical and operational options for the joint forces or Marine Air Ground Task Force (MAGTF) commander. These forces move via surface and air lift to objectives inland. Maneuver units take only minimum essential logistics support and rely on resupply from the sea base. The logistical footprint ashore can be expanded as the mission requires, particularly if it evolves into sustained operations ashore. The intent is to “provide the joint force commander with forces optimized for forward presence, engagement, crisis response, and warfighting that will achieve his operational objectives.”[9]

APPLICATION[10]

The Marine Corps currently has the capability to conduct limited STOM operations. Task Force 58’s performance during Operation Enduring Freedom (OEF) is the most recent example. Recent analysis conducted by the Marine Corps Combat Development Command entitled *Ship-to-Objective Maneuver (STOM) Concept of Operations (CONOPS)* addresses future STOM

operational capabilities.[11] The scenario for this study is derived from the Defense Planning Guidance. Planning and execution of the scenario within established parameters achieved the following results:

- Forces operate from a sea base located 25 nautical miles OTH.
- This sea base consists of six amphibious ships and six ships in the MPF(F), six High Speed Vessels (HSV), organic heavy surface lift[12] and 28 aircraft operating spots.
- The two smaller MAGTFs are organized into a surface lift task force and a vertical lift task force. Each of these consists of two reinforced infantry battalions. The surface force is mechanized. The vertical lift task force consists of light infantry with Light Armored Vehicles (LAV).
- Day one puts 4,861 personnel and 558 vehicles ashore. Day two puts the reserve battalion ashore for a total of 6,753 personnel and 886 vehicles ashore, both at surface task force and vertical task force objectives.
- The vertical assault executes in four waves and carries personnel, equipment, supplies and the Combat Service Support Detachment (CSSD). During one period of darkness (seven hours and 45 minutes), 195 sorties of MV-22 Osprey tilt-rotor aircraft and 76 sorties of CH-53E heavy lift helicopters deliver 2,153 Marines, 25 LAVs, 170 vehicles, and supporting equipment to an objective located 85 miles inland (a total of 110 nautical miles from the sea base). This effort is supported by 53 sorties of AH-1/ UH-1 attack and utility helicopters and 32 Joint Strike Fighter (JSF) sorties providing escort support, command and control, close air support, and naval surface fire support direction.
- The surface lift task force conducts forcible entry operations during the hours of darkness in a mined environment using four lanes per battalion. The surface assault consists of three cycles and a total of 76 Expeditionary Fighting Vehicles (EFV), 30 Landing Craft Air Cushion (LCAC), and 18 Landing Craft Utility (Replacement) (LCU(R)) sorties. It lands the following personnel and equipment at its objective during one period of darkness:
    - 2,708 Marines
    - 76 Expeditionary Fighting Vehicles[13]
    - 50 LAVs
    - 22 M1A1 tanks
    - Two Assault Breacher Vehicles[14]
    - Eight Expeditionary Fire Support Systems[15]

    - Six Lightweight-155mm howitzers
    - 180 High Mobility Multi-purpose Wheeled Vehicles (HMMWV)
    - 26 Medium Tactical Vehicle Replacements (MTVR – trucks)
- The MEB[16] closes a force of over 13,000 Marines within a seven-day period using multidimensional strategic lift assets that includes:
    - Self-deploying aircraft: 30 Joint Strike Fighter (STOVL version – Short Take-Off, Vertical Landing), 48 MV-22s, five EA-6Bs or its future replacement, twelve KC-130s, and 314 personnel.
    - Commercial airlift: 22 747s transporting a total of 9,094 personnel.
    - Strategic lift: 48 C-17s carrying 20 CH-53s, nine UH-1s, 18 AH-1s, aviation ground support equipment, critical low-density/high-demand cargo and 182 personnel. This force completes at-sea arrival and assembly with the sea base using MV-22s and high-speed vessels. [17]

A second study, entitled *Mission Area Analysis, Operational Reach – 2015* , analyzes the ability of a MEF-sized MAGTF to project combat power ashore. While this study incorporates surface lift capabilities, its primary focus is vertical lift capabilities and limitations in a STOM scenario using MV-22 and CH-53E aircraft with accompanying escort aircraft. The purpose of the landing plan is to ensure a rapid, orderly, and tactical build up of combat power ashore. These characteristics become critical when assessing the effectiveness of the plan as ranges are extended. The study analyzes distances from 25 to 200 nautical miles in order to answer the questions “how much, how far, and how fast.”[18]

This study’s primary focus is vertical assault capabilities. It also confirms, however, that sufficient current and projected surface lift capabilities exist to conduct STOM-related surface assaults.[19]

This scenario uses 78 MV-22s and 28 CH-53Es for the vertical assault portion of the Base Case landing plan.[20] A total of 732 sorties land the entire force at the vertical assault objective located 95 miles from the sea base (397 sorties for the assault forces, 205 sorties for the combat trains, and 130 sorties for the CSSD). This puts 3,823 Marines and Sailors plus 479 vehicles or pieces of equipment ashore in a two-day period. This includes 4,000 gallons of fuel and the artillery battalion’s basic load of ammunitions plus one day of allowance (DOA). [21]

These two studies confirm that the Marine Corps will be capable of projecting large mechanized forces ashore via surface lift platforms from sea bases located approximately 25 nautical miles over the horizon. It is the ability to project and sustain forces over the horizon from a sea base that differentiates current capabilities from future ones. These studies also

calculate that the operational range of regimental-sized vertical assault forces culminates at 110 nautical miles from the sea base. Since it is the vertical assault that comprises true STOM capabilities, the following study analyzes the capabilities of a smaller force by looking at extended range operations for the Marine Expeditionary Unit (Special Operations Capable).[22]

The results of this study entitled *MEU (SOC) Extended Range Operations* show that a reinforced infantry company-sized force package has an operational range of 200 nautical miles from the sea base, 90 more nautical miles than the regimental-sized forces in the previous two studies. The risk factors identified in this study focus on conditions that could prevent a successful operation. Such factors include weather conditions, availability of aircraft, availability of appropriate type ships, deck management issues such as sufficient deck spots and rotations, and embarkation issues. This study concludes that while such missions are possible they have an almost zero percent margin of error, particularly in terms of aircraft operational readiness. This type of mission is dependent upon two KC-130J aerial refueling platforms, a distinguishing factor between it and the other studies. According to the maintenance and readiness parameters used for this study, vertical assault aircraft meet mission requirements 80 percent of the time while fixed-wing aircraft meet requirements 50 percent of the time.[23]

This last study focuses on MEB seabasing and, thus, is entitled *Seabasing Concept of Operations*. It is based on the classified version of STOM CONOPS, but extends the campaign to 22 days and stresses logistics to determine overall requirements.[24] It is in fact the fourth in a series of sea based operations in-process reviews and builds on the conclusions of the previous three. It validates the findings and conclusions of STOM CONOPS while identifying additional areas that require further refinement. This study organizes its findings in three main areas: movement conclusions, sustainment conclusions, and overall “take-aways.”

The movement conclusions validate that initial assaults are feasible within periods of darkness. Vertical assaults take 7.4 hours to complete and surface assaults take 6.6 hours to complete. As previously stated, embarkation management and configuration is critical to the assault and is directly related to deck spot utilization. Additionally, the synergistic effect of the combined capabilities of the Expeditionary Strike Group and the Maritime Prepositioning Group significantly enhances rapid buildup ashore.[25] Both vertical and surface assaults are challenging, but supportable.[26]

Sustainment conclusions validate that forces ashore can be sufficiently resupplied by air. Intermodal packaging, one of the critical capabilities provided by the future ship designs in the MPF(F), is essential. It allows for improved packaging, greater quantities, and better visibility of all items, particularly the smaller items that tend to get lost in the mass of supplies and that are

critical for embarkation and logistics, i.e., slings, nets, drums, etc. This future capability exponentially improves seaborne warehousing, retrieval, and loading capabilities and is one of the critical elements of sea based logistics. It directly relates to embarkation efficiency and deckspace management. [27]

The most significant findings in this section concern fuel consumption and identify it as the biggest logistical challenge of STOM. The problem applies to both the platforms used to project forces ashore and the forces themselves. Due to the substantial vertical and surface lift requirements, lift platforms use more fuel then forces ashore.[28]

The major insights from this MEB Sea Basing analysis are:

- STOM CONOPS is basically sound, but it is a work in progress that requires continuous updating as new developments occur.
- One hundred ten mile ship-to-objective maneuver is supportable.
- Embarkation is the key to the assault.
- Intermodal packaging and slings are critical enablers that require accurate warehousing visibility.
- Synergism between Expeditionary Strike Groups and the Maritime Prepositioning Group is a critical requirement.

ANALYSIS

The Marine Corps' stated objective is for the "sea base to develop to the point where it is able to fully support a MEB with an air-delivered and sustained battalion-size maneuver unit out to 200 nautical miles from the sea base with some elements to 240 nautical miles. Small tailored units could be supported at ranges greater than 240 nautical miles to the full range of naval supporting fires, air and missile defense within limits of logistics reach."[29] The distances are based on the projected operational range capabilities of the MV-22 Osprey and the EFV. [30] The results of the studies discussed in the previous section fall short of these ranges, but nonetheless demonstrate a considerable capability for a joint force commander. This section analyzes issues identified by these studies requiring resolution as the Marine Corps, in conjunction with the Navy, continues to develop the concept of Expeditionary Warfare, the technology required for sea basing, and the doctrine, tactics, techniques, and procedures for STOM in order for STOM to realize its full potential.

Essentially, STOM is a precision strike capability on a large scale. And, in line with the Department of Defense's focus on long-range precision attack operations, it is heavily dependent on improved intelligence, surveillance, and reconnaissance (ISR) capabilities across

all three spectrums of warfare – tactical, operational, and strategic. While the Marine Corps controls most aspects of its own tactical and operational ISR requirements, it has no control of the military and intergovernmental agencies that provide the highest levels of strategic intelligence required for such operations. The planning assumption that these agencies will not only be able to provide the high resolution of intelligence required, but will also be fully dedicated and focused on providing it "real time" to naval forces involved in STOM operations is tenuous. This could potentially violate the premise for making sound planning assumptions, which is not to assume away an enemy's capability or to create a friendly one that does not exist. It remains to be seen how this affects the ultimate operability of STOM. [31]

High-volume Naval Surface Fire Support (NSFS) is still essential in STOM. It may be even more critical than in conventional amphibious operations because some trade-off in ground-based fire support may be necessary for vertical assault forces in terms of the operational level of fire support required. The logistical footprint and sustainment requirements of ground-based fires also present a challenge.[32] The Marine Corps' development of the lightweight 155mm howitzer and the Expeditionary Fire Support System are attempts to address this problem. The Navy is developing the Advanced Gun System for its next generation destroyer, the DD(X), to support STOM maneuver forces at the ranges and distances required.[33]

Fundamental changes in logistics support and organization may be among the most significant related to STOM. The Marine Corps is approaching this problem from two directions. One approach involves increased efficiency and effectiveness through internal restructuring. The other is based on the actual reduction of requirements ashore. The development of integrated logistics consolidates maintenance and logistics functions at higher echelons in order to reduce the requirements of combat units. Future combat service support shifts many logistics functions and responsibilities from the units to the MAGTF Combat Service Support Element (CSSE), minus aircraft maintenance. This allows unit logistics officers to focus on requests and coordination with the CSSE instead of focusing on internal logistics support. Conceptually, this potentially reduces the logistics section of an infantry battalion from 50 to ten Marines.[34] This reduction in the personnel footprint ashore is meant to accompany the reduction in demand brought about by future technologies that allow for more efficient vehicles and increased visibility of logistic and maintenance requirements at the CSSE level. The plan is to reduce the MEB sea-based Flow-in-Echelon table of equipment by more then 50 percent. If more is required for sustained operations ashore then it can be phased into theater and ashore.

Opponents of the integrated logistics concept argue that ground combat is about effectiveness, not efficiency. They contend that redundancy is required at all levels – personnel,

equipment, supplies, and maintenance capabilities. This is a greater concern for the motorized and mechanized units that have larger logistical and maintenance requirements. And while this concept may be appropriate, even necessary, for a vertical assault task force, it may cause problems for the surface assault task forces comprised of heavier units (EAVs, tanks, trucks, artillery, LAVs). How these issues are resolved and incorporated into future STOM operations will be critical to their sustainability and overall success.

Naval countermine capabilities are essential for littoral operations. Amphibious forces must be able to clear lanes through the Very Shallow Water Zone (10 to 40 feet depth), and the Surf Zone/ Craft Landing Zone (zero to ten feet depth). This capability must allow for in-stride breaching without disrupting the momentum of the surface assault. The goal is to create four transit lanes per battalion and eight Littoral Penetration Points (LPP)[35] per regiment. The joint force commander and the Navy have responsibility from the sea base to the beach exits. The Marine Corps has it from the beach to the objective. This concept requires all LCACs, EFVs, and LCU(R)s to have a common tactical picture (CTP) that electronically displays cleared lanes through the breached areas, backed-up by visual markings. *STOM CONOPS* states that "negotiating a marine minefield in a GPS-denied environment at night in Sea State III could be challenging."[36] This may be the greatest understatement ever written in a military publication.

It further states that the MEB must have the capability of conducting reconnaissance on 32 potential LPPs, even though as few as eight may eventually be used.[37] Littoral Penetration Points can be 500 meters apart. Littoral Penetration Sites (LPS) are notionally five kilometers wide and are separated by approximately three kilometers. This equates to over four-and-a-half miles of shoreline. This is a daunting requirement even with the combined assets of Navy Seal and Marine Force Reconnaissance teams.

Operation DESERT STORM exposed our countermine capability as lacking and it has not improved sufficiently since then. STOM CONOPS states that "technological advances will *likely* [emphasis added] support remote clandestine, detection, classification, identification, marking, and monitoring of mines and obstacles at sea and ashore."[38] A recent Government Accounting Office (GAO) report states that current forces "are not effectively capable of breaching and clearing mines in very shallow water near the shore."[39] The Navy's Mine Warfare Section, N752, identifies the area between the Surf Zone and the Craft Landing Zone as being the most deficient, not necessarily the Very Shallow Water Zone as the GAO report states. This happens to be the area where responsibilities for countermine operations shift from the Navy to the Marine Corps, tactically referred to as a seam. It is also the area that allows for less expensive mines to have greater antiaccess effect. The impact of this has not gone unnoticed by either the

Marine Corps or the Navy. Part of the problem relates to money and resource priorities while the other part relates to science and technology. This is a critical vulnerability for surface assault forces in STOM operations. Finding an affordable solution that the Marine Corps agrees with and the Navy supports is critical.

Strategic airlift, military and civilian, remains essential in EMW/ STOM operations to transport personnel and equipment to advance bases. Even with multiple means of force projection including self-deploying aircraft, high speed vessels, and Navy amphibious shipping, the scenario in *STOM CONOPS* requires 22 747s and 48 C-17s to rapidly transport required personnel to the advance base. There they get on high-speed "connectors" for transport to the sea base. This is not an exorbitant amount of aircraft if Transportation Command (TRANSCOM) is not supporting multiple concurrent strategic lift missions. It might become a fight for resources, however, during a large-scale time-phased force deployment contingency. And, as the Army is reorganizing into a more modular expeditionary force, it puts even more emphasis on strategic lift requirements to get forces into theater. This situation may not be different from current joint requirements, but it is worth exploring from an inter-Service perspective.

The one glaringly obvious fact about STOM operations is their absolute reliance on significant amounts of vertical lift assets and capabilities, much more so then either current ground or amphibious operations require. Ship-to-Objective Maneuver as envisioned is dependent on the capabilities of the MV-22 and the CH-53E (SLEP) and the capability to conduct continuous large-scale air assault operations, exponentially larger then anything the Corps is currently capable of doing. The studies analyzed in this paper provide specific and accurate data on lift requirements for initial assaults and subsequent resupply flights, but they do not take into consideration sustained operations ashore in a high casualty environment. Even though many casualties are transported via surface lift, considering the myriad combat scenarios possible it is realistic to expect that the majority of these will require vertical lift to get from the objective to the casualty collection point to await surface lift to the sea base. The worst-case scenario entails concurrent assault insertions with multiple casualty missions. This stretches already thinly stretched lift assets even further.

Increased reliance on all Marine air platforms makes the Marine air component even more integral to the MAGTF concept. The Marine Corps defends its aviation arm on a regular basis against both military and political critics who see it as a redundant asset. Critics argue that it runs contradictory to joint concepts and intent for the Marine Corps to have its own airspace and, specifically, fixed-wing aircraft. The Corps has been successful so far, but as jointness continues to permeate the Services and the Congress, it may become a more tenuous position.

Ship-to-Objective-Maneuver adds strength to the argument for the Marine Corps. But, in order to carry the necessary weight to win the argument, STOM must prove itself not only successful but also vital to joint operations.

Surface lighterage is another lift asset critical to STOM. Current capabilities will not meet future requirements. Even with the purchase of more high speed vessels, the service life extension of the LCAC, and the introduction of the LCU(R), more and better types of lighterage are needed to meet the full range of requirements, especially logistical. These vessels require the capability to marry-up to MPF(F) ships and conduct in-stride replenishment. Ship-to-Objective Maneuver is as dependent on these types of surface lift assets as it is on vertical lift assets. And, as increased reliance on air makes the Marine Air Wing more integral to the Marine Corps and its MAGTF concept, increased reliance on Navy surface lift has the same effect on the Navy-Marine Corps relationship. In fact, it is one of the few areas in the military that begins to achieve the joint objective of *dependence* rather than *interoperability*.

At the moment, however, there is a disconnect between the two Services. While lighterage to support STOM operations is a priority for the Marine Corps, the Navy has several other acquisition project priorities, and surface lift is not at the top of that list. The Navy must put more emphasis in this area if it is to see the realization of Sea Strike as laid out in its Naval Transformation Roadmap.[40]

Over-the-horizon and long range communications is essential for STOM operations. This is a recognized critical capability and is proving to be one of the most challenging. It requires aerial retransmission platforms with wide/narrow band satellite communication (SATCOM) capability. MV-22s equipped with the Joint Tactical Radio System can communicate via narrow band Ultra High Frequency (UHF) SATCOM. Both vertical and surface assault forces require Wide Area and Local Area Network (WAN/ LAN) capabilities in order to receive the Current Operational/Current Tactical Picture (COP/ CTP). The intent is for situational awareness at all levels to be achieved through battlefield visualization made possible by the COP/ CTP. The increased command and control and intelligence requirements of STOM make it essential that these are always available. Database backups and redundant communication systems supposedly ensure this happens.[41] Intelligence is dependent on “unprecedented amounts of detailed and accurate information”[42] which it achieves through reachback connections to joint and national agencies and which requires their cooperation. Ship-to-Obective Maneuver requires huge communications pathways to make this happen. Even with FORCEnet,[43] there is still a chance for competing requirements to impact command and control, communication, and intelligence capabilities. In this regard STOM makes itself dependent on the same amount of

“exquisite intelligence” that Network-centric warfare does. It is arguable whether such levels of intelligence can be achieved. Even if they can, dependence on such information provides a cautionary warning. There is a difference between developing these capabilities and maximizing their effectiveness, and developing operational concepts that are too dependent on them.

IMPLICATIONS

This paper states four objectives:

- Analyze the operational reach of STOM as determined by recent studies;
- Determine what the Marine Corps wants to do with this capability;
- Determine what the Marine Corps and the Navy need to do in order for STOM to become an operational reality; and,
- Determine what this capability offers national command authorities and combatant commanders.

Current studies demonstrate that a MEB-sized force will be capable of conducting STOM operations out to 110 nautical miles from a sea base located 25 miles over the horizon. While STOM operations consist of both surface and vertical assault forces, it is only the vertical assault force that is capable of achieving this 110 nautical mile range during the first period of darkness. Both forces are comprised of two infantry battalions. The surface assault force is mechanized and the vertical assault is infantry-pure. Naval surface fire support, air assets, and inherent mortar and artillery capabilities provide fire support for both. Both forces are capable of logistical sustainment from the sea base, although continued sustainment of the vertical assault force by air assets alone will prove challenging, but feasible. Extended range operations beyond this 110 nautical mile limit are capable with smaller forces. A reinforced company of approximately 250 Marines is capable of conducting vertical assault operations out to 200 nautical miles from the sea base.

The Marine Corps sees Seabasing and STOM as transformational capabilities, but it provides its own perspective on the nature of transformation. The Marine Corps considers something transformational if it invents a new capability that did not exist, or it makes an existing capability better by orders of magnitude. It identifies four pillars of transformation: operational change, institutional agility, leap-ahead technology, and acquisition and business reform.[44] In this context Seabasing is certainly a transformational capability. Whether or not STOM meets these parameters is arguable. The larger question is, “Does it need to be?” The simple answer is no, it does not. Assuming current acquisition programs remain on schedule and on budget, the capability to project and sustain elements of a MEB-sized force or a reinforced company

from a sea base as far as 110 or 200 nautical miles, respectively, provides joint force commanders multiple operational and tactical options that do not currently exist.

How significant is it that current projections fall short of the stated 200-240 nautical mile ranges? It is not very significant at this point. It would be another matter if the Army and the Marine Corps were developing similar capabilities and were involved in a bidding war over which one had the greater operational reach capability. But they are not, nor is this within the realm of Army roles and functions. Besides, the Army is busy enough trying to make itself modular so that it can task organize much along Marine Corps lines. And, as this concept matures, real operational data and tactics, techniques, and procedures will no doubt expand operational reach capabilities. It will take trial and error combined with technological modifications and ingenuity to overcome the physics that currently limit lift ranges.

In the interim, the intent is to provide combatant commanders with innovative capabilities that might be used to prevent hostilities before they begin, to gain decisive tactical results that have operational and even strategic impact, and to lay the foundation for further operational expansion.

The critical capabilities required to make Seabasing and STOM realities are the current technologies being developed (or not) to support it. Sections III and IV discuss these technologies, along with strengths, weaknesses, and additional requirements. Transformational capabilities begin as concepts that equipment and doctrine are then developed to support, not the other way around. Similar to when it developed and refined the concepts of amphibious operations which identified the need for amphibious tractors and new classes of amphibious ships, the Marine Corps, in conjunction with the Navy, is developing the concepts of Seabasing and STOM which are identifying the need for the MV-22, EFV, CH-53E (SLEP), LCAC (SLEP), MPF(F), high speed vessels, and LCU(R). These are either being developed, are available for purchase, or are at least in some stage of conceptual development. The issues of sufficient additional lighterage, naval surface fire support, and mine countermeasure capabilities remain questionable, if not contentious, and must be resolved for Seabasing and STOM to realize full operational effectiveness. Despite this, the cooperation between the Marine Corps and the Navy in this endeavor is almost unprecedented, not only between themselves but also among the Services as a whole. The massively expensive acquisition programs of both services in support of Seabasing and STOM provide proof of this.

Is it worth it? The naval Services seem to think so, especially the Marine Corps. It appears to be betting the farm on it considering the prices tags of the MV-22 Osprey and the Expeditionary Fighting Vehicle (which costs as much as an M1A1). But does this mean that the

Marine Corps envisions itself conducting only ship-to-objective operations from over-the-horizon sea bases. No, but it does believe that the ability to do this exponentially enhances current capabilities that will continue to be available to combatant commanders and national decision makers.

A larger question is what exactly a MEB-sized unit conducting STOM operations at these distances can accomplish. This question must be kept in context in order to be answered properly. The concept of seabasing allows not only for initial STOM operations, but also perhaps more importantly, for the follow-on expansion into sustained operations ashore if required. It can be argued that the capabilities discussed herein offer little beyond an operational or tactical raid, even at the MEB level. This would be true if an operation consisted solely of initial assault forces with limited sustainment and without the ability to be reinforced. But the concept of STOM operations aligns very much with the Marine Corps building block concept of MAGTFs. That is, MEUs can be built into MEBs which can become MEFs as the situation develops. So, too, can surface and assault forces in STOM operations be supplied and reinforced from the sea base which, in turn, can be replenished from its reachback sea and air lines of communication. The entire system of systems allows for incremental build up and sustainment of forces ashore if sustained operations ashore become necessary. If used properly and in a timely manner, however, the real intent of STOM is to prevent the situation from growing into sustained land combat, or, as previously stated, to "significantly alter the initial conditions of a conflict."[45] Forces of this size, flexibility, and reach inserted at the right place and time should be able to do this and more.

Chapter Five of the National Security Strategy states that in order to support preemptive options America must continue to transform its military forces to ensure our ability to conduct "rapid and precise operations to achieve decisive results."[46] Expeditionary Maneuver Warfare, OMFTS, Seabasing, and STOM support this directive perhaps better then any other current capability or initiative among the Services or within the Department of Defense. And, as the concept and technologies mature into reality, the applications for the joint force commander and for all the Services increase. It would behoove the Services, particularly the Army with its propositioning program, to partner with the Navy and Marine Corps in the development of this concept. Doing so now would prevent a costly game of catch-up later.

WORD COUNT= 5,871

ENDNOTES

[1] Col. Arthur J. Corbett, "The Family of Concepts," *Marine Corps Gazette* (October 2003): 20.

[2] United States Marine Corps*, Operational Maneuver From The Sea*, Marine Corps Concepts Paper (Washington, D.C.: U.S. Department of the Navy, Headquarters, United States Marine Corps, Marine Corps Combat Development Command, 1 January 1997), 20.

[3] United States Marine Corps, *Expeditionary Maneuver Warfare*, Marine Corps Capstone Concept, Marine Corps Concepts Paper (Washington D.C.: U.S. Department of the Navy, Headquarters, United States Marine Corps, Marine Corps Combat Development Command, 10 November 2001), 1.

[4] Corbett*, "The Family of Concepts,"* 20.

[5] United States Marine Corps, *Seabased Logistics*, Marine Corps Concepts Paper (Washington D.C.: U.S. Department of the Navy, Headquarters, United States Marine Corps, Marine Corps Combat Development Command, 3 June 1998), 1.

[6] Corbett, *"Family of Concepts,"* 20.

[7] United States Marine Corps, *Marine Corps Concepts and Programs 2003*, (Washington D.C.: U.S. Department of the Navy, Headquarters, United States Marine Corps, Marine Corps Combat Development Command, 2003), 50.

[8] Idid., 21.

[9] United States Marine Corps, *Ship-To-Objective-Maneuver (STOM) Concepts of Operations (CONOPS)*, Marine Corps Concepts Paper (Washington D.C.: U.S. Department of the Navy, Headquarters, United States Marine Corps, Marine Corps Combat Development Command, 3 March 2003), iii, 1-2, 1-3.

[10] This section discusses the results of four studies on STOM and Seabasing conducted by the Marine Corps Combat Development Command. It also contains information obtained from the Navy's N75 Section, Director, Expeditionary Warfare. These studies examine the projected capabilities, limitations, and operational reach of MEB and MEU(SOC)-sized Marine Air-Ground Task Forces (MAGTF) using technology, equipment, vessels, and vehicles both in operation today and intended to be operational by 2015.

[11] The force disposition and composition is based upon a baseline 2015 Marine Expeditionary Brigade (MEB) that is formed using a nonstandard organizational construct consisting of two separate, smaller MAGTS within a larger MAGTF (a similar construct was used by TF-58 in OEF). It consists of two expeditionary strike groups (ESG) carrying two MEU(SOC)s and a flow-in echelon (FIE, a new term connected to these concepts) of one infantry regiment, one air component element (ACE), and one brigade service support group (BSSG). All arrive in theater within seven days of notification and are ready to execute at D+5. STOM operations do not commence until D+8. Expeditionary Strike Groups have replaced Amphibious Ready Groups and consist of amphibious ships, surface combatants, and an attack submarine. This makes it a self-contained strike force instead of the previous three-ship

amphibious lift force. The first ESG is currently in work-up and is commanded by a Marine. (United States Marine Corps, *STOM CONOPS*, iii, 1-3, V).

[12] The Australians have built the protoype high speed vessel. It is a catamaran design capable of speeds over 40 knots and ranges of 1,200 nautical miles fully loaded, 3,000 nautical miles empty. It carries a significant numbers of personnel and rolling stock, but it has no berthing facilities for troops. Modifications are being explored to make it capable of carrying helicopters and heavier land vehicles (tanks). The Landing Craft Air Cushion has been in service since 1986. It carries 60-plus tons at 40 knots for 200 nautical miles. There are currently 74 in operational status with ten in reduced operational/ non-operational status. They are about to enter a Service Life Extension Program (SLEP) that will significantly increase the vessel's capabilities and will extend its Expected Service Life (ESL) another 30 years. This is vital to the success of STOM. Additionally, a heavy lift LCAC is being studied to meet OTH surface lift requirements. This vehicle could have a 100 percent increase in lift capacity for armored vehicles, internal capacity for 75-100 troops, and the capacity for 400 troops with personnel transport modules. The Landing Craft Utility (Replacement), will be a significant improvement over the current slow and limited ship-to-shore version. It will be an over-the-horizon capable craft that can carry 160 to 200 long tons at ranges of approximately 1,000 miles and will be capable of speeds in excess of eleven knots in Sea State 3. These lighterage platforms are critical for the implementation of STOM. (Department of the Navy, *Naval Expeditionary Warfare, Naval Amphibious Warfare Plan, Decisive Power…Global Reach* , (Washington D.C.: U.S. Department of the Navy, Expeditionary Warfare Division, 1 June 2002), 58, 59, 61, 62.

[13] The Expeditionary Fighting Vehicle (EFV), formerly know as the Advanced Amphibious Assault Vehicle (AAAV), is the replacement for the Marine Corps' current fleet of Amphibious Assault Vehicles (AAV). Its water planing design gives it waters speeds up to twenty-knots with extended range capabilities either at sea or on land. It can transit 25 nautical miles over water and then range approximately 250 miles on land at speeds up to 45 miles per hour. It carries a Mk 44 Mod 1 30mm automatic gun and a 7.62mm coaxial machine gun. It carries 17 combat equipped Marines or 5,000 pounds of cargo. (Department of the Navy, *Decisive Power…Global Reach*, 33.) The Marine Corps plan is to procure 1,013 EFVs, but this is currently under consideration. The program's milestones are for low-rate initial production in FY 2005, initial operational capability in FY 2008, and full operational capability in FY 2018. This will occur sooner if the decision is made to procure fewer vehicles. (United States Marine Corps, *Marine Corps Concepts and Programs 2003* , 112).

[14] The Assault Breacher Vehicle (ABV) is a full-tracked, armored engineer vehicle designed to conduct in-stride breaching of minefields and complex obstacle. It is built on a modified IPM1 tank chassis and includes a Full Width Mine Plow, two Line Demolition Charges, a ground marking system, a remote control kit, and a weapons station. Procurement is anticipated to begin during FY 2006. (United States Marine Corps, *Marine Corps Concepts and Programs 2003*, 115).

[15] The Expeditionary Fire Support System (EFSS) is still in the conceptual stage. It will become the final system of the fire support triad consisting of the Light Weight 155mm Howitzer and the High Mobility Artillery Rocket System (HIMARS). It will be the primary indirect fire support system for the vertical assault element in STOM and will be transportable by tiltrotor aircraft or helicopter. The best guess at this point is that it might look something like a modernized 120mm mortar system. However, the Integrated Production Team (IPT) is currently

conducting studies and market research of potential material solutions. (United States Marine Corps, *Marine Corps Concepts and Programs 2003*, 117).

[16] The MEB forms an element of the Expeditionary Strike Force. This ESF consists of a Carrier Strike Group (CSG), Expeditionary Strike Group (ESG), and the Maritime Prepositioning Group (MPG). United States Navy warships include two nuclear-powered carriers (CVN), five cruisers (CG), two destroyers (DDX), two nuclear attack submarines reconfigured to carry 154 Tactical Land Attack Missiles (TLAM) and modifications for special forces units (changing the classification from SSBN to SSGN), two attack submarines (SSN), two amphibious assault ships, multipurpose (LHD), two amphibious transport dock ships (LPD), and two dock landing ships (LSD). These forces form the entirety of the sea base from which naval power is projected, supported, and sustained. It closes into the joint objective area (JOA) within a seven-day period. (United States Marine Corps, *STOM CONOPS*, conclusion, 2).

[17] Ibid., conclusion, 1- 2.

[18] The scenario includes three regimental landing team (RLT) objectives, two surface assault (Objectives A and C) and one vertical assault (Objective B). The initial distances from the sea base to the objectives are 37 (Objective A), 86 (Objective B), and 31 (Objective C) nautical miles. An additional nine nautical miles are factored into Objective B for evasive maneuvers and obstacle avoidance, making the total distance 95 nautical miles for vertical assault forces. (United States Marine Corps, *Mission Area Analysis, Operational Reach – 2015, Final Report*, Washington D.C.: U.S. Department of the Navy, Headquarters, United States Marine Corps, Marine Corps Combat Development Command, 2 June 2000, 3, 7).

[19] The scenario lands five infantry battalions (three mechanized and two truck-mobile), four tank companies, four Light Armored Reconnaissance (LAR) companies, three artillery battalions, two combat engineer companies, and four Low Altitude Air Defense (LAAD) platoons at Objectives A and C within one period of darkness. Combat trains and Combat Service Support Detachments (CSSD) land the next day. This accounts for a total of 11,162 Marines and 3,498 vehicles and pieces of equipment between the two objectives. (United States Marine Corps, *Operational Reach – 2015*, 1-5) Surface assaults are an integral component of EMW and STOM. And, while future capabilities like the EFV, HSV, LCAC (SLEP), and LCU(R) greatly enhance this capability by making over-the-horizon operations possible, the fact remains that surface assaults do not provide the capability to conduct pure STOM operations as envisioned by the Marines Corps' future concept. Only vertical assault capabilities attain the power projection and operational reach distances envisioned by STOM, which is why this study focuses on them.

[20] The Marine Corps is buying 360 MV-22s based on its Operational Requirements Document (ORD). These 72 aircraft represent 20 percent of the fleet. It is currently planned for the Air Force to buy 50 and the Navy to buy 48, although the Marine Corps is fielding them much earlier then the other two. Nonetheless, the eventual fielding of these additional aircraft should potentially expand the options available for STOM and other operations in the joint environment. Concerning the CH-53E (SLEP), recent decisions occurring after the publications of these studies have changed this plan. A new aircraft, not a rebuild, will replace the current CH-53E fleet. It will look very much like the current aircraft and will probably be called the CH-53F. However, since this is not yet definitive it will continue to be called the CH-53E (SLEP) in this paper. It will be a one-for-one replacement of the current 'echo' fleet which is a total of 154 aircraft. These 28 aircraft represent 18 percent of the fleet. (MajGen Amos, USMC (ret), Aviation

Requirements, Marine Corps Combat Development Command, telephone interview by author, 14 January 2004.)

[21] United States Marine Corps, *Operational Reach – 2015*, 5.

[22] In this scenario, the MEU(SOC) supports Special Operations Forces conducting direct strike operations. A reinforced company conducts a raid to seize a blocking position in support of the main effort. The force package includes 253 Marines (includes four HMMWVs, crew-served and anti-tank weapons, and 60mm mortars), twelve MV-22s, six joint strike fighters, four CH-53E (SLEP) heavy lift helicopters, four AH-1Z attack helicopters, three UH-1Y utility helicopters, and two KC-130J aerial refueling planes. The inclusion of aerial refueling capabilities distinguishes this study from the previous one. The *Operational Reach – 2015* scenario uses only inherent aircraft ranges and ground refueling for helicopters where possible. (Maj. Robert J. Stevenson, USMC, Mission and Analysis Branch, Studies and Analysis Division, Marine Corps Combat Development Command, "Mission Area Analysis, MEU (SOC) Extended Range Operations, Executive Summary," results of study presented in brief format to BGen S.T. Helland, Assistant Deputy Commandant for Aviation, Headquarters, United States Marine Corps, 13 November 2003, slides 14, 15).

[23] Ibid, slide 31.

[24] United States Marine Corps, *Mission Area Analysis, MEB Sea Basing, IPR #4, Revised Base Case, (*Washington D.C.: U.S. Department of the Navy, Headquarters, United States Marine Corps, Marine Corps Combat Development Command, 20 November 2003), 4.

[25] Ibid, 46.

[26] This section supports use of the LCAC as the MPF(F) landing craft because it proved to get the job done by almost one and a half hours quicker then the other two future technologies used for this study. Twenty percent of this is due to landing constraints on displacement craft and 80 percent is due to the greater speed of the LCAC (Ibid., 29).

[27] Ibid., 59.

[28] In this extended scenario with its continuous lift and resupply requirements, the Expeditionary Strike Group runs out of fuel at S+12 (S day is the commencement of STOM operations). The reachback capability of the sea base allows for the ESG to be resupplied, and there are other sources of fuel, specifically the Maritime Preposition Group. While this does not shut down STOM operations it does highlight their additional logistical considerations, the importance of accurate logistical planning, and the requirement for sea lines of communication (SLOCs) to be fully operational in order to adequately support extended over-the-horizon ship-to-objective-maneuver operations. (Ibid., 64, 68)

[29] Draft, *Seabasing Concept of Operations* (Department of the Navy, Expeditionary Warfare Division, United States Marine Corps, Expeditionary Force Development, Marine Corps Combat Development Command, 30 January 2003), 3.3.

[30] Major Robert J. Stephenson, Mission Area Analysis Branch, Studies and Analysis Division, Marine Corps Combat Development Command, interviewed by author, 9 December 2003, Marine Corps Base, Quantico, VA.

[31] Recent events in OIF highlight this problem. The following is from 1st Marine Division's G-2: "The division's ability to influence the theater and national intelligence collection activity was limited. A shortage of theater collection platforms was aggravated by the use of these collectors for deep missions at the expense of maneuver units…. On the high-tempo battlefield, the highly centralized theater intelligence architecture proved too slow and cumbersome to be tactically relevant." (LtCol. Michael S. Groen, "Blue Diamond Intelligence: Division-Level Intelligence Operations During Operation IRAQI FREEDOM," *Marine Corps Gazette* (February 2004): 25.

[32] United States Marine Corps, *STOM CONOPS*, 1-9.

[33] The future destroyer, DD(X), will carry two 155mm Advanced Gun Systems (AGS). This will fire the Long Range Land Attack Projectile (LRLAP), a boost-glide GPS-guided round that provides a high degree of accuracy, but is not considered a precision-guided munition. The maximum range of this round is classified. The AGS fires 10 rounds a minute and the DD(X) will have a 600 round magazine which may be increased to 1,000 rounds. The plan is to build 24 DD(X)s with two per Expeditionary Strike Group. The first one should be operational in FY 13. The AGS also has counterbattery radar capability. An interim round, the Extended Range Munition (ERGM) is being developed to meet current requirements until the AGS and LRLAP are fielded. It is fired out of 5"/62 naval guns. This program is currently experiencing difficulties and is behind fielding schedule. The Navy and the Marine Corps are conducting long term research on electromagnetic energy to fire both ship and land vehicle weapons systems. (LtCol Jeffrey Seng, USMC, N753G, NSFS Requirements, Expeditionary Warfare Branch, United States Navy, interview by author, 15 December 2003, Headquarters, United States Navy, Washington, D.C.).

[34] United States Marine Corps, *STOM CONOPS*, 1-12.

[35] New amphibious control measure terms are used for OMFTS/STOM operations. Littoral Penetration Areas (LPA) are possible geographic objective areas along a coastline, potentially separated by hundreds of miles. The intent is to provide options for the strike group or joint force commander while increasing the dilemma for the enemy. Littoral Penetration Zones (LPZ) divide an LPA into several axes of advance. Littoral Penetration Sites (LPS) are segments of coastline within the LPZ that vertical or surface assault forces cross en route to their objectives (in amphibious assault terms it is the point where they go "feet dry"). Littoral Penetration Points (LPP) are points within the LPS where surface assault vehicles transition from waterborne to landborne movement. These can accommodate a single craft or a unit in column. If terrain allows, these are expanded to allow units to pass through in tactical formation.

[36] United States Marine Corps, *STOM CONOPS*, 11-5.

[37] Ibid., 11-10.

[38] Ibid., 1-15.

[39] General Accounting Office, Navy Acquisitions, Improved Littoral War-Fighting Capabilities Needed (Washington, D.C.: U.S. General Accounting Office, October 2003), obtained from Headquarters, United States Marine Corps, Strategic Initiatives Group website http://hqinet001.hqmc.usmc.mil/PP&O/SIG/TopSight/tsfin.htm; accessed 14 November 2003.

[40] These differing priorities are highlighted in the statements made in March of 2003 before the Subcommittee on Readiness, House Armed Service Committee, U.S. House of Representative by the Vice Chief of Naval Operations and the Assistant Commandant of the Marine Corps. The Marine Corps statement refers to its 3.0 MEB amphibious lift requirement, the sea-basing concept and the need for *'new' lighterage to support it* [emphasis added], the need to integrate amphibious lift with MPF, Sea Strike, LPD-17, and the LHD-8 (the new refit referred to as the 'plug-plus'). The Navy statement refers to none of these. It refers to Sea Power 21 only twice, both times in rather general terms. It also makes no mention of Naval Power 21, the document that speaks to Navy/Marine future concepts, vision, and cooperation. The Marine Corps statement does not specifically mention Naval Power 21 either, but its concepts run throughout the document.

[41] United States Marine Corps, *STOM CONOPS*, 9-1.

[42] Ibid, 9-6.

[43] FORCEnet seeks to digitally integrate Navy and Marine Corps communications systems, sensors, weapons, and platforms, including ships, airplanes, and land vehicles. It will be a WEB-enabled network intended to be the umbrella under which the Naval services operate. (Rear Admiral Thomas E. Zelibor, "FORCEnet is Navy's Future: Information-sharing, from seabed to space" *Armed Forces Journal* (December 2003): 50, 51.)

[44] LtCol Rich Webster, USMC, Transformation Branch, Futures Warfighting Division, Marine Corps Combat Development Command, "Marine Corps Transformation," briefing slide 5, Carlisle Barracks, U.S. Army War College, 18 November 2003.

[45] United States Marine Corps, *Marine Corps Concepts and Programs 2003*, 21.

[46] George W. Bush, *The National Security Strategy of the United States of America* (Washington, D.C.: The White House, September 2002), 16.

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